

What is claimed is:

1. A gamma voltage correcting apparatus for a liquid crystal display wherein a liquid crystal pixel is arranged at each intersection between data lines and gate lines and video data is corrected by a preset gamma voltage to display an image, said apparatus comprising:

5 memory means for storing gamma data for controlling the gamma voltage for each of at least two modes;

control means for accessing the gamma data for each mode in response to an instruction from a user; and

10 a multi-channel gamma voltage generator for responding to the gamma data for a mode selected by the control means to generate n gamma voltages (wherein n is an integer) having a different voltage level indicated by the gamma data for the selected mode.

15 2. The gamma voltage correcting apparatus according to claim 1, further comprising a column driver for correcting the video data using the gamma voltage from the multi-channel gamma voltage generator and supplying the corrected video data to the data lines.

20 3. The gamma voltage correcting apparatus according to claim 2, further comprising a buffer unit for buffering a signal having the gamma voltage from the multi-channel gamma voltage generator to apply it to the column driver.

4. The gamma voltage correcting apparatus according to claim 1, further comprising a voltage-dividing resistor for dividing the n gamma voltages into m gamma voltages (wherein m is an integer larger than n) having a different voltage level.

25 5. The gamma voltage correcting apparatus according to claim 1, wherein the multi-channel gamma voltage generator includes:

a data receiver for receiving the gamma data and a clock signal in the mode selected by the control means;

30 a reference voltage generator for dividing an externally supplied supply voltage to generate the gamma voltages having a different voltage level; and

n gamma voltage selectors (wherein n is an integer) for interpreting the gamma data

from the data receiver to select a reference voltage indicated by the gamma data for the gamma voltages from the reference voltage generator.

6. The gamma voltage correcting apparatus according to claim 1, wherein the
5 memory means and the control means are integrated into a single integrated circuit.

7. The gamma voltage correcting apparatus according to claim 2, further comprising:
a row driver for sequentially applying a scanning pulse to the gate lines to drive the
gate lines; and

10 a timing controller for supplying red, green and blue digital video data to the column
driver and for applying a desired timing control signal to the row driver.

8. The gamma voltage correcting apparatus according to claim 7, wherein the
memory means, the control means and the timing controller are integrated into a single
15 integrated circuit.

9. A video data correcting apparatus for a liquid crystal display which includes a
liquid crystal panel having a liquid crystal pixel arranged at each intersection between data
lines and the gate lines, said apparatus comprising:

20 memory means for storing a lookup table in which color temperature correction data
for correcting a color temperature characteristic of an input image is set in correspondence
with a gray level value of the input image;

memory control means for accessing the lookup table of the memory means in
accordance with the gray level value of the input image to read out the color temperature
25 correction data corresponding to the gray level value of the input image; and

data driving means for driving the data lines using the color temperature correction
data from the memory control means.

10. The gamma voltage correcting apparatus according to claim 9, further
30 comprising:

a row driver for sequentially applying a scanning pulse to the gate lines to drive the

gate lines; and

a timing controller for supplying the input image to the memory control means and for applying a desired timing control signal to the row driver.

5 11. The gamma voltage correcting apparatus according to claim 9, wherein the color temperature correction data is measured after controlling the input image such that a color temperature of a displayed image on the liquid crystal display maintains approximately 6500K.

10 12. The gamma voltage correcting apparatus according to claim 9, wherein a displayed image of the liquid crystal display on which the color temperature correction data is displayed maintains a brightness and a contrast equal to the input image.

15 13. A method of correcting a gamma voltage in a liquid crystal display wherein a liquid crystal pixel is arranged at each intersection between data lines and gate lines and video data is corrected by a preset gamma voltage to display an image, said method comprising:
 storing gamma data for controlling the gamma voltage for each of at least two modes;
 accessing the gamma data for each mode in response to an instruction from a user;
 selecting any one of the gamma data for each mode; and
20 responding to the gamma data for the selected mode to generate n gamma voltages (wherein n is an integer) having a different voltage level indicated by the gamma data in the selected mode.

25 14. The method according to claim 13, wherein the gamma data is set differently in accordance with each mode set in correspondence with peripheral equipment interchangeable with the liquid crystal display.

30 15. The method according to claim 13, wherein the gamma data is set differently in accordance with each mode set in correspondence with an optical recording medium player, a television image signal display device, and a camcoder.

16. The method according to claim 13, further comprising the steps of:
dividing the n gamma voltages into m gamma voltages (wherein m is an integer larger
than n) having a different voltage level; and
correcting the video data using the m gamma voltages and supplying the corrected
5 video data to the data lines.

17. The method according to claim 16, further comprising:
buffering the m gamma voltages and applying the buffered m gamma voltages to the
column driver.

18. A method of correcting video data in a liquid crystal display which includes a
liquid crystal panel having a liquid crystal pixel arranged at each intersection between data
lines and gate lines, said method comprising:

providing a lookup table in which color temperature correction data for correcting a
15 color temperature characteristic of an input image is set in correspondence with a gray level
value of the input image;

accessing the lookup table in accordance with the gray level value of the input image
to read out color temperature correction data corresponding to the gray level value of the
input image; and

20 driving the data lines using the color temperature correction data.

19. The method according to claim 18, wherein the color temperature correction data
is data measured after controlling the input image such that a color temperature of a displayed
image on the liquid crystal display maintains approximately 6500K.

20. The method according to claim 18, wherein a displayed image of the liquid
crystal display on which data corrected by the color temperature correction data is displayed
maintains a brightness and a contrast equal to the input image.

21. A device for providing a desired gamma voltage for a liquid crystal display (LCD),
said device comprising:

a memory for storing gamma data corresponding to a plurality of modes;
a controller for receiving an external mode signal and in response thereto selecting
selected gamma data from the memory; and
means for generating a plurality of gamma reference voltages according to the selected
5 gamma data.

22. The device of claim 21, wherein the means for generating the plurality of gamma
reference voltages comprises a multi-channel digital-to-converter (DAC).

10 23. The device of claim 22 wherein the multi-channel digital-to-converter comprises:
a reference voltage generator for receiving a supply voltage and generating a plurality
of reference voltages;
a data receiver for receiving the reference voltages and the selected gamma data and
generating therefrom the plurality of gamma reference voltages.

15 24. The device of claim 21, further comprising:
a gamma voltage generator receiving the plurality of gamma reference voltages and
generating therefrom a plurality of gamma voltages.

20 25. The device of claim 21, wherein the gamma voltage generator comprises a
resistor divider network.

26. The device of claim 24, further comprising means for selecting the selected
gamma voltage from the plurality of gamma voltages.

25 27. The device of claim 26, wherein the means for selecting the selected gamma
voltage comprises a DAC.

30 28. The device of claim 21, wherein each of the plurality of modes corresponds to a
different source video generator for providing video data to the LCD.

29. A method of providing a desired gamma voltage for a liquid crystal display, comprising:

storing gamma data corresponding to a plurality of modes in a memory device;

receiving an external mode signal and in response thereto selecting selected gamma

5 data from the memory; and

generating a plurality of gamma reference voltages according to the selected gamma data.

30. The method of claim 29, wherein generating the plurality of gamma reference
10 voltages comprises:

receiving a supply voltage and generating therefrom a plurality of reference voltages;

and

generating the plurality of gamma reference voltages from the gamma data and the
15 plurality of reference voltages.

31. The method of claim 29, further comprising generating a plurality of gamma
voltage from the plurality of gamma reference voltages.

32. The method of claim 31, wherein generating the a plurality of gamma voltages
20 comprises dividing the plurality of gamma reference voltages in a divider network.

33. The method of claim 31, further comprising selecting the selected gamma voltage
from the plurality of gamma voltages.